SESSION III

DETECTION AND CONFIRMATION OF AN EPIDEMIC OF YELLOW FEVER

OBJECTIVES: At the end of the lesson, participants will be able to:

- √ explain the steps in detecting and confirming an epidemic of yellow fever
- √ describe clinical yellow fever
- √ give the case definitions for yellow fever
- √ explain how and whom to notify of suspected cases

METHODS: Presentation, discussion, written exercises

MATERIALS: Forms used at district and health center level

PREPARATION:

___ Assemble materials

____ Practice the lecture and put transparencies in order

____ Obtain the name and address of the person(s) who should be notified of a suspected epidemic; try to find several ways of contacting them.

____ If there are other people (e.g., counterparts across the border, police, customs agents etc.) who should be notified, get the names and contact addresses for them also.

____ Obtain a copy of the form that is used for "Immediate Notification" of diseases, and make one copy for each participant (if not available, participants may use the sample form in the *Exercise Book*).

LEARNING ACTIVITIES 1 hour

1. Introduction

Explain the topic and the objectives. Explain that the information given in this lesson is also found in Chapters 2 and 3 of the *Guidelines on the Detection and Control of Epidemic Yellow Fever*.

2. Lecture: Detecting And Confirming Yellow Fever Epidemics

Give a lecture on detecting and confirming epidemics of yellow fever, using the prepared overhead projector transparencies.

There are reduced versions of the lecture transparencies on the following pages. There is room for you to write additional information that you want to mention during the lecture.

How to Detect and Confirm Epidemic Yellow Fever

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Purposes of Surveillance

- Detect epidemics early
- Estimate how many cases and deaths
- Assess extent of the epidemic
- See if an epidemic is spreading, and where
- Plan distribution of supplies and staff
- Determine effectiveness of control measures

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Effective Surveillance

- Essential to recognition of epidemics
- Depends on clinical diagnosis of cases
- Depends on laboratory confirmation
- Requires effective reporting system

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Diagnosis of Yellow Fever

- **Definitive diagnosis requires laboratory**
  - **serology**
  - **virus isolation**

- **Clinical diagnosis is not easy**
  - **very difficult early in outbreak**
  - **malaria may be identical to early yellow fever**
  - **many causes of undifferentiated fever**

- **Maintain high index of suspicion for**
  - **fevers not responsive to antibiotics or antimalarials**
  - **increased admission and death rates from hepatitis**
  - **reports of many deaths following fevers**

Spectrum of Clinical Illness

- **Undifferentiated febrile illness**
  - resembles many other fevers

- **Classic Yellow Fever**
  - fever, vomiting, epigastric pain
  - prostration, dehydration
  - scleral icterus
  - renal and hepatic abnormalities
  - hemorrhagic tendency
  GI bleeding - black vomitus

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Phases of Clinical Yellow Fever

- **Phase 1 - non specific febrile illness**
  - viremic patient, but diagnosis difficult
- **Period of Remission**
  - brief clinical improvement
  - 3rd-4th day after onset
- **Phase 2 - "intoxication"**
  - hepatic and renal dysfunction
  - bleeding
- **50% case fatality rate for severe YF**

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Suggestive Physical Signs

- **Fever is almost always present**
- **Faget's sign - relative bradycardia**
  - slow heart rate in relation to fever
- **Conjunctival congestion**
- **Flushing of face and neck**
- **Tongue reddened at end and margins**
- **Minor gingival hemorrhages**

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Surveillance Case Definitions

- **SUSPECTED CASE =**
  Sudden onset of fever, followed by jaundice
  AND one or more:
  - **bleeding in the mouth**
  - **black vomitus**
  - **death**

- **CONFIRMED CASE =**
  Suspected case AND
  - **virus isolation from blood or liver OR**
  - **positive neutralization or IgM capture**

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Surveillance Case Definitions

Suspect Possible Yellow Fever

- **Fever with scleral icterus OR**
- **Fever with scleral icterus in a patient with a negative malaria smear.**
- **Additional case definition for use during epidemics (not mandatory)**
- **Less strict definition produces a more accurate case count in epidemic**

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Report Suspected Yellow Fever Cases Urgently

- **Report a single suspected case immediately**
- **Report a suspected epidemic immediately**
- **Do not wait for confirmation**
- **Take informal reports seriously**
  - **from travelers and merchants**
  - **from the public**
  - **from news reports**

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How To Report Suspected Yellow Fever

- **Report to the designated level**
- **Use most rapid and reliable means available**
  - **telephone**
  - **radio**
  - **FAX or TELEX**
  - **telegram**
  - **courier (Ministry or informal)**
- **When using informal or unsure means, send a back-up report as well**

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What to Report

- **Number of cases and deaths**
- **Location of cases**
- **Date of onset of disease**
- **Clinical details**
- **Action taken**

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Record Patient Information

- **Diagnosis**
- **Date of consultation and of onset of symptoms**
- **Age, sex, address**
- **Specimens obtained**
- **Treatment**
- **Outcome**

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Zero Reporting

- **Zero reporting = during an epidemic, send a report even if no cases or deaths occurred**
- **Distinguishes between areas**
  - **that really had no cases**
  - **that did not send a report**
  - **from which the report did not arrive**
- **Helps evaluate effectiveness of vaccination campaign**

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Role of Clinical Health Workers in Surveillance

- Collect information
- Fill out and send in forms promptly
- Immediately report suspected cases of YF
- Make graphs and maps
- Analyze the information and act on it

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When Informed of **Suspected Yellow Fever Cases - Actions at District Level -**

- **Review reports of suspected cases**
  - do they meet the case definition?
  - are they clinically consistent with YF?
- **Contact nearby health facilities**
  - have they seen cases?
  - remind them of clinical presentation and case definitions
- **Send an Investigation Team to the field**
- **Inform the province when there are patients who meet the case definition**

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Laboratory Confirmation of Yellow Fever

- **Not routine for most laboratories**
- **Identify a reference laboratory in the country**
  and / or
- **Arrange for laboratory support with the WHO country or Regional Representative**
- **Control of YF demands extraordinary resources - which may not be given until laboratory confirmation is obtained.**

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3. Exercise - Case Definition of Yellow Fever

Ask participants to turn to page 1 in their *Exercise Books*, and do the Exercise on the case definition of yellow fever. Tell them:

- √ in this exercise, you will read about patients who live in a district where there has been no yellow fever
- √ decide whether each patient meets the case definition for *suspected* yellow fever or not (check "Yes" or "No" to indicate your answer)
- √ next, decide whether the patients meet the case definition for *suspect possible* yellow fever (circle the description of each patient that meets that case definition)
- √ you may consult the *Guidelines on the Detection and Control of Epidemic Yellow Fever* to find the answers, but do not consult each other.

When they have finished, review the correct responses, and answer any questions. As you review the answers, write the case definitions on the chalkboard, or flipchart, or ask participants to turn to Chapter 3 in the *Technical Guidelines on the Detection and Control of Epidemic Yellow Fever*. The correct answers, with some additional explanation for discussion, are in *italics* below — participants need answer only Yes or No, and circle their selection.

SHORT ANSWER EXERCISE - CASE DEFINITION OF YELLOW FEVER

Read about these patients and decide whether or not they meet the case definition for suspected yellow fever. Yellow fever has not been reported in the district.

a) An 18-year old student developed a fever followed by jaundice. There is no bleeding in the mouth, no black vomitus, and he is still alive. The malaria smear was negative.

Suspected Yellow Fever: No, he does not meet the case definition. He has fever followed by jaundice, but none of the other three elements of the case definition.

Suspected Possible Yellow Fever: Yes, he meets the case definition. He has "fever with scleral icterus", and his malaria smear is negative.

b) A 7-year-old boy is seen at a rural clinic for high fever, followed five days later by scleral icterus and bleeding in his mouth. A malaria smear is positive for *P. falciparum.*

Suspected Yellow Fever: Yes. He has fever, followed by jaundice; and he has one of the three other elements of the case definition, "bleeding in the mouth".

Suspected Possible Yellow Fever: There are two Suspected Possible Case definitions depending on whether the results of a malaria smear are available. This boy does meet the case definition of "fever with scleral icterus", but he does not meet the case definition "fever with scleral icterus in patients with a negative malaria smear".

c) A 5-year-old girl died at home after developing fever and yellow eyes.

Suspected Yellow Fever: Yes, she had fever, followed by jaundice and one of the three other elements -- "death".

Suspected Possible Yellow Fever: Yes, she had fever with scleral icterus.

d) An 11-year-old boy arrived at the clinic with high fever, retrobulbar pain, chills, and myalgia. He was treated for malaria, but did not improve.

Suspected Yellow Fever: No. He does have a fever, but no other elements of the case definition. He does have some signs and symptoms that are consistent with yellow fever, but even so, he does not meet the case definition. He might have yellow fever, or he might have some other febrile disease.

Suspected Possible Yellow Fever: No, he does not meet this case definition.

Now assume that you are on an investigation team. The epidemiologist has decided to use the case definition *suspect possible* yellow fever during the investigation. Read about each patient again, and decide whether he or she meets the case definition for yellow fever. Circle the description of each patient that does.

4. Identify Person(s) To Be Notified Of Cases Of Suspected Yellow Fever

a. Ask participants to turn to the inside cover of the *Technical Guidelines*

b. For each person whom they should notify about suspected cases of yellow fever, ask participants to write:

- √ name
- √ title
- √ address (mailing and physical)
- √ method(s) of contacting the person

c. Discuss the best ways to send the notification. Participants from the same area, and their supervisors, may discuss the best methods together. The methods will vary, but might include:

- √ a telephone number & alternate numbers in the same town
- √ a FAX number
- √ radio (discuss the location of a radio operator)
- √ special courier (discuss who it might be)
- √ the bus schedule so that an envelope can be given to the driver, and so on.

If they are to contact other persons (police, community leaders, customs officials, teachers, cross-border colleagues, etc.) list those persons also.

5. Written Exercise - Notification Form

a. Distribute a copy of the immediate notification form to each participant (or have them use the sample form in the *Exercise Book*). Remind them that although this is a written form, and will be sent, in addition, the *information* on the form should be communicated as quickly as possible (telephone, telegram, radio, FAX, etc.).

b. Ask participants to turn to page 1 in the *Exercise Book* and re-read their answers to the Case Definition Exercise. Ask them to fill out the notification form as though the patients in the exercise had come to their health facility.

c. Check their forms when they have finished.

6. Summary of Key Points

Ask a participant to summarize the key points, or briefly summarize them yourself.